McKinsey Global Institute

April 2014

Global flows in a digital age: How trade, finance, people, and data connect the world economy

The McKinsey Global Institute

The McKinsey Global Institute (MGI), the business and economics research arm of McKinsey & Company, was established in 1990 to develop a deeper understanding of the evolving global economy. Our goal is to provide leaders in the commercial, public, and social sectors with the facts and insights on which to base management and policy decisions.

MGI research combines the disciplines of economics and management, employing the analytical tools of economics with the insights of business leaders. Our "micro-to-macro" methodology examines microeconomic industry trends to better understand the broad macroeconomic forces affecting business strategy and public policy. MGI's in-depth reports have covered more than 20 countries and 30 industries. Current research focuses on six themes: productivity and growth; natural resources; labor markets; the evolution of global financial markets; the economic impact of technology and innovation; and urbanization. Recent reports have assessed job creation, resource productivity, cities of the future, the economic impact of the Internet, and the future of manufacturing.

MGI is led by three McKinsey & Company directors: Richard Dobbs, James Manyika, and Jonathan Woetzel. Michael Chui, Susan Lund, and Jaana Remes serve as MGI partners. Project teams are led by the MGI partners and a group of senior fellows, and include consultants from McKinsey & Company's offices around the world. These teams draw on McKinsey & Company's global network of partners and industry and management experts. In addition, leading economists, including Nobel laureates, act as research advisers.

The partners of McKinsey & Company fund MGI's research; it is not commissioned by any business, government, or other institution. For further information about MGI and to download reports, please visit www.mckinsey.com/mgi.

Copyright © McKinsey & Company 2014

McKinsey Global Institute

April 2014

Global flows in a digital age: How trade, finance, people, and data connect the world economy

James Manyika
Jacques Bughin
Susan Lund
Olivia Nottebohm
David Poulter
Sebastian Jauch
Sree Ramaswamy

Global flows …

$26 trillion flow of goods, services, and finance in 2012, equal to 36% of global GDP

Up to **$450 billion** added to global GDP growth each year by flows—and 40% more benefit for the most connected countries than the least connected

63% of global goods flows through the top 50 routes in 1990, down to **54%** in 2011

18-fold increase in cross-border Internet traffic between 2005 and 2012

38% of total cross-border flows of goods, services, and finance from emerging economies in 2012, up from **14%** in 1990

… by the numbers

Up to **$85 trillion** flow of goods, services, and finance by 2025, three times the value in 2012

500% increase in international Skype call minutes since 2008

12% of global goods trade from China in 2012, vs. **2%** in 1990

Growth in knowledge-intensive goods trade **1.3x** as fast as in labor-intensive goods

90% of commercial sellers on eBay export to other countries, vs. less than **25%** of traditional small businesses

Executive summary

Global flows have been a common thread extending through the mercantilist and colonial eras, from trade routes of old such as the renowned Silk Road through the industrial revolutions that swept across Europe and North America in the 18th and 19th centuries to the more recent rise of emerging economies. But today the web of cross-border exchanges has exploded in scope and complexity.

The opening up of economies that started in the early 1990s and brought Eastern-bloc countries and Asia fully into the global economy set the stage. However, two major forces are now accelerating the growth and evolution of global flows. The first is increasing global prosperity. By 2025, 1.8 billion people around the world will enter the consuming class, nearly all from emerging markets, and emerging-market consumers will spend $30 trillion annually, up from $12 trillion today.[1] This will create enormous new hubs for consumer demand and global production. The second major force is the growing pervasiveness of Internet connectivity and the spread of digital technologies.[2] More than two-thirds of us have mobile phones.[3] In 2012, there were 2.7 billion people connected to the Internet.[4] A torrent of data now travels around the world. Cross-border Internet traffic grew 18-fold between 2005 and 2012.

In this report, we examine how these forces are transforming global flows and explore why they matter for nations, companies, and individuals. We track inflows and outflows of goods, services, finance, and people, as well as the underlying flows of data and communication that cut across all of them (Exhibit E1).[5] Our database covers 195 countries between 1980 and 2012 and enables us to study the dynamics and network structure of these flows and their cumulative impact on countries and growth. We have also created the McKinsey Global Institute

1 *Urban world: Cities and the rise of the consuming class*, McKinsey Global Institute, June 2012; Yuval Atsmon, Peter Child, Richard Dobbs, and Laxman Narasimhan, "Winning the $30 trillion decathlon: Going for gold in emerging markets," *McKinsey Quarterly*, August 2012.

2 *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, McKinsey Global Institute, May 2011.

3 *The state of broadband 2013: Universalizing broadband*, UNESCO and ITC, September 2013.

4 *The world in facts and figures 2013—ICT facts and figures*, International Telecommunication Union, 2013.

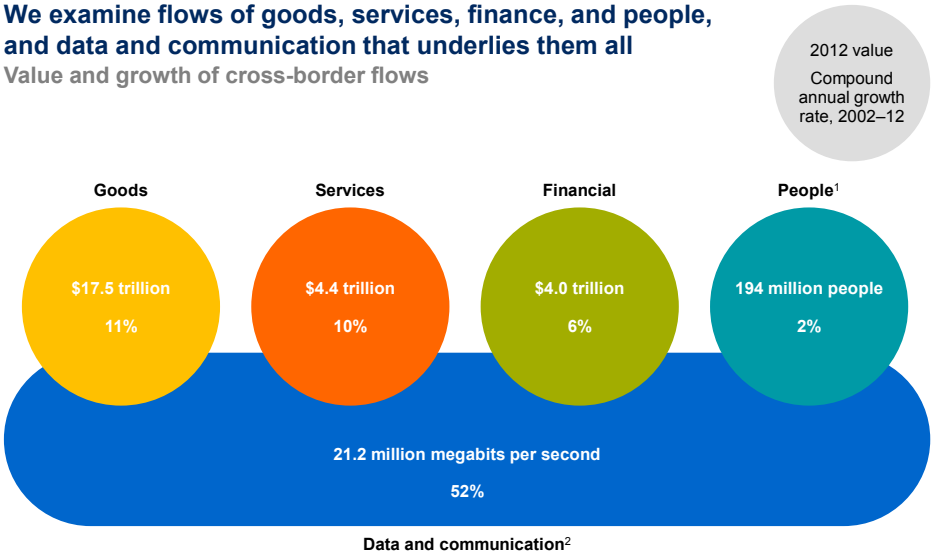
5 We define goods and services flows as the sum of imports and exports of goods and services for each country; financial flows are the inflows and outflows of foreign direct investment, equity and bond flows, and cross-border lending and deposits; people flows include the number of people who move for long-term migration, short-term travelers, and students; and data and communication flows include the volume of cross-border Internet traffic and international call minutes. For each flow, we also explore emerging digital flows such as e-commerce, online work platforms, remittances and payments, and other microdata. See the technical appendix for a full definition.

Connectedness Index, which measures each country's level of integration into the global network of flows for 131 countries.[6]

Exhibit E1

We examine flows of goods, services, finance, and people, and data and communication that underlies them all

Value and growth of cross-border flows



1 Measured by cross-border migrants; values from 2000 and 2010.
2 Measured by cross-border Internet stock traffic; values from 2005 and 2013.
SOURCE: Comtrade; IHS Economics & Country Risk; World Bank; Bank for International Settlements; IMF Balance of Payments; Telegeography; Web of Science, Thomson Innovation; McKinsey Global Institute analysis

Among our key findings are the following:

- **Global flows are growing and contribute to GDP growth.** Flows of goods, services, and finance in 2012 reached $26 trillion, or 36 percent of global GDP—1.5 times as large relative to GDP as they were in 1990. If the spread of digital technologies and rising prosperity in emerging economies continues, global flows could nearly triple by 2025 and boost economic growth. We find an overall positive correlation between each type of flow and GDP growth, and we estimate that global flows contribute between $250 billion and $450 billion of growth every year to world GDP, or 15 to 25 percent of total global growth. In addition, we find that economies with more connections see up to 40 percent more benefit from participation than do less connected economies.

- **The McKinsey Global Institute Connectedness Index shows that developed economies remain more connected than emerging markets—but that the latter are rising rapidly.** Overall, developed economies remain more connected to global flows than emerging markets, but some are rising quickly. Germany tops the overall list, while the United States is third. Among emerging markets that are becoming more connected are Brazil, China, India, Morocco, and Saudi Arabia. For some countries, "flow intensity"—the value of flows relative to the size of their economy—is significant and growing. Among the world's large economies, Germany has a flow intensity of 110 percent, China, 62 percent, Mexico, 78 percent, and India, 61 percent.

6 The MGI Connectedness Index builds on similar work measuring the degree to which different countries are connected to global activity, including the DHL Connectedness Index produced by Pankaj Ghemawat and Steven A. Altman, and globalization indexes from Ernst & Young, AT Kearney, and the Swiss Economic Institute. See, for example, Pankaj Ghemawat and Steven A. Altman, *Depth index of globalization 2013: And the big shift to emerging economies*, IESE Business School, University of Navarra, 2013.

- **The knowledge-intensive portion of global flows increasingly dominates—and is growing faster than—capital- and labor-intensive flows.** In the past, global flows were dominated by labor-intensive flows from low-cost manufacturing nations and commodity-intensive flows from resource-rich economies. But today knowledge-intensive flows account for half of global flows, and they are gaining share. For instance, knowledge-intensive goods flows are growing at 1.3 times the rate of labor-intensive goods flows. Although developed economies as a group dominate knowledge-intensive flows, China's knowledge-intensive flows are the world's second largest.

- **Digitization is transforming and enriching all flows.** Digitization reduces the marginal costs of production and distribution and is transforming flows in three ways: through the creation of purely digital goods and services that are either transformations of physical flows or entirely new products, through "digital wrappers" that enhance the value of physical flows, and through digital platforms that facilitate cross-border production and exchange. Moreover, digitization has begun to change the mix of flows. Some goods flows are becoming services flows, for instance. All this is creating significant new opportunities for innovation and disruption.

- **Networks of global flows are broadening and deepening as emerging economies join in.** Emerging economies are becoming important as both consumers and producers in the global economy, and now account for 38 percent of global flows, nearly triple their share in 1990. South-South trade between developing economies has grown from just 6 percent of goods flows in 1990 to 24 percent in 2012. In absolute terms, the increase has been from $198 billion to $4.4 trillion.

- **Global flows are shaped by—and are influencing—trends in major sectors.** As global supply chains become more fragmented and countries specialize in production, flows of intermediate goods (as opposed to final goods) are soaring. Digitization is likely to help to transform global logistics and manufacturing sectors by replacing some physical flows with virtual flows. Digital platforms are enabling new players to participate in sectors ranging from shipping to payments.

- **Companies, entrepreneurs, and individuals have more opportunities to participate.** Governments and multinational companies were once the only actors involved in cross-border exchanges, but today digital technologies enable even the smallest company or individual entrepreneur to be a "micromultinational" that sells and sources products, services, and ideas across borders. Traditional business models are being challenged by microscale activities ranging from microwork to micropayments and microshipments.[7]

The new era of dramatically broadening and deepening global flows will create many new opportunities for governments and companies to drive growth and innovation and will open the door to greater participation by entrepreneurs and individuals. But there will need to be new investments and focused policy, above all to embrace the increasingly digital nature of global flows. A concerted effort to improve the data in this area will be essential. At the same time, both business

7 "Microwork" refers to a series of disaggregated tasks that together make up a single project. Several people may contribute to the project, each one handling an individual set of discrete tasks.

leaders and policy makers will need to negotiate a range of challenges, including stresses to business models, support for workers caught in the transition, and risks to data privacy and security that are part and parcel of an increasingly data-driven world. Incumbent businesses across industries will face a new wave of competition from new types of competitors both at home and abroad.

Finding ways to harness the positive potential of global flows to raise living standards and shared prosperity while mitigating the risks is imperative. The cost of being left behind—for countries, companies, and individuals—is rising.

Global flows have created a tightly interconnected world economy

Given the twin forces of rising prosperity in emerging markets and the increasing impact of digital technologies, a growing share of the world's economic activity involves cross-border flows. Today, 35 percent of goods cross borders, up from 20 percent in 1990. More than a third of all financial investments in the world are international transactions, and a fifth of Internet traffic is cross-border. Services and people, however, remain far less internationally traded—because of their intrinsic link to relatively immobile human capital.

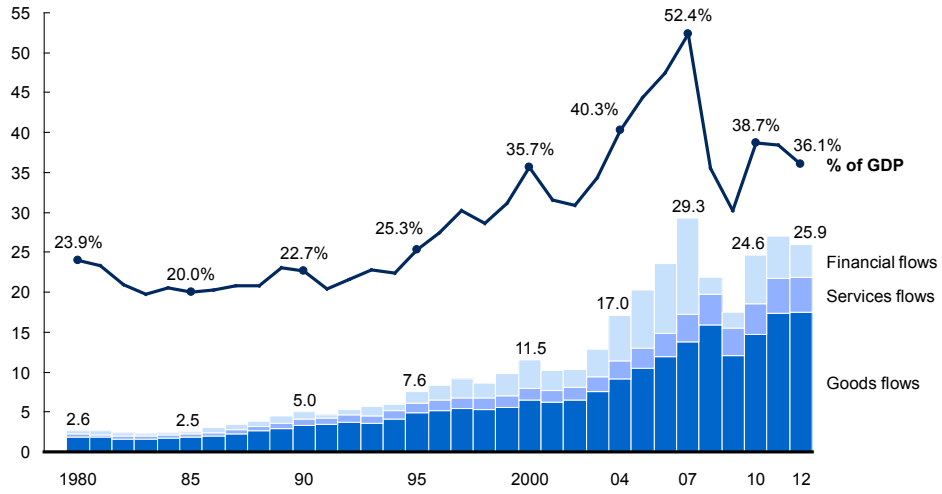
By 2012, the combined value of trade in goods and services plus financial flows reached $26 trillion, or 36 percent of global GDP, compared with just $5 trillion, or 23 percent of world GDP, in 1990 (Exhibit E2).

Exhibit E2

Traditional flows of goods, services, and finance reached $25.9 trillion in 2012

Goods, services, and financial flows; share of GDP, 1980–2012

$ trillion, nominal; %



SOURCE: Comtrade; IMF Balance of Payments; World Trade Organization; McKinsey Global Institute analysis

Although services sectors now account for roughly two-thirds of world GDP, trade in goods (including commodities) remains by far the largest type of flow, at $17.8 trillion in 2012, or 24 percent of global GDP. This was more than four times the value of either services flows at $4.2 trillion or cross-border financial flows of $3.9 trillion.

As goods flows have increased, their direction has also changed. Developed economies used to dominate global trade—54 percent of all goods trade in 1990 was between developed economies—but in 2012 these flows accounted for only 28 percent. This shift has been offset by the increasing participation of emerging economies in global goods trade, both as exporters and as importers. Emerging economies now account for 40 percent of goods flows, and 60 percent of those go to other emerging economies—so-called South-South trade.

All types of global flows dropped during the 2008 financial crisis and recession, but goods and services flows have since surpassed their 2007 peak. In contrast, financial flows remain almost 70 percent below their pre-crisis level, falling from 21 percent of global GDP to only 5 percent in 2012. This reflects the correction from the global credit bubble and deleveraging of the financial system. Financial flows have changed direction, too, with outflows from emerging markets rising from 7 percent of the global total in 1990 to 38 percent in 2012. The share of financial flows among developed regions fell from 89 percent in 2002 to 57 percent in 2012.

The picture is mixed on flows of people. While the share of people living outside their home country has remained remarkably steady at 2.7 percent since 1980, short-term travel and students enrolling in foreign universities have grown at 3.4 percent and 4.8 percent per annum, respectively, between 2002 and 2010. The direction of people flows has changed as well. A larger share of migrants is moving from emerging to developed economies—29 percent of migrants in 1990 compared with 42 percent in 2010. But a different pattern is emerging in short-term travel. Here, emerging economies are gaining share of total inbound and outbound travelers. Flows of short-term travelers between emerging economies have grown from 18 percent of total flows in 2002 to 23 percent in 2010. Also in 2010, emerging economies accounted for 33 percent of all outbound travelers, up from 25 percent in 2000, and 51 percent of all inbound travelers, from 44 percent in 2000.

Underlying these four flows is the soaring exchange of data and communication across borders. Global online traffic has grown from 84 petabytes a month in 2000 to more than 40,000 petabytes a month in 2012—a 500-fold increase.[8] Cross-border voice traffic has more than doubled over the past decade, primarily due to digital calls. Skype call minutes grew to 39 percent of the level of traditional international phone call minutes, having increased more than 500 percent since 2008.

Global flows matter for economic growth

Many people harbor misgivings about the risks and costs that global flows entail. Volatile capital flows can wreak havoc on economic growth and some local jobs are eliminated as global supply chains are restructured. While acknowledging these costs, our analysis confirms the academic literature in finding a positive correlation between each of the global flows and GDP growth. These results persist in a variety of model specifications and indicate that flows (normalized by GDP for goods, services, financial, and data and communication flows, and by population for people flows) contribute to faster GDP growth. We estimate that

8 One petabyte is 10^{15} bytes of digital information where 1 byte is the standard measure of one unit of digital information.

global flows raise world GDP growth by between $250 billion and $450 billion annually—approximately equivalent to the GDP of Finland or Norway. We also find that countries that are more connected within global networks of flows experience larger benefits in terms of GDP growth than countries that are less connected.[9] The most central countries to the global network of flows in our database can expect to increase GDP growth from flows up to 40 percent more than the least connected countries. For example, Thailand, a high-centrality country, would disproportionately benefit compared with Laos, its low-centrality neighbor.

To gauge the potential scale of future flows, we developed a range of scenarios that consider how the twin forces of rising emerging-market prosperity and digitization could play out in the future. We find that global flows of goods, services, and finance could increase from $26 trillion, or 36 percent of GDP, in 2012 to between $54 trillion and $85 trillion in 2025, or 38 percent to 49 percent of global GDP, depending on the scenario. The key determinants of where within this range flows actually materialize are the strength of economic growth in emerging economies and their decisions on participation in global flows, whether the potential transformation of flows from digital technologies reaches its full potential, and policy decisions made by governments around the world.

Developed economies remain more connected than emerging markets—but the latter are gaining ground rapidly

The McKinsey Global Institute Connectedness Index measures the connectedness of 131 countries across all five flows of goods, services, finance, people, and data and communication. The index reflects the level of inflows and outflows of all types of flows adjusted for country size. It is not sufficient to look at flow intensity alone—a country's level of flow relative to GDP—because, in dollar terms, this leaves the world's largest and more diversified economies looking relatively closed. This happens because a relatively small share of their overall economic activity happens across borders. Conversely, smaller economies look exaggeratedly prominent in flows because they inevitably have larger flows of goods, services, and finance compared with the size of their GDP. Smaller European countries such as Luxembourg, Belgium, Ireland, and the Netherlands have all seen large increases in intensity. In Asia, Hong Kong and Singapore have experienced a 400 to 500 percent increase in flows intensity.

Our index assesses both a country's global share of flows (to control for country size) and its flow intensity. The index is a single measure to reflect connectedness across flows, and it enables us to understand how a country's connectedness has increased or decreased over time, what types of flows are responsible, and how the direction of the country's flows has changed (Exhibit E3).[10] Our index yields some interesting—and sometimes surprising—results (Exhibit E4).

9 Our methodology, an error-correction model that allows for non-stationarity of variables, indicates causality as well as correlation. The centrality measures we use come from the French economic research institution CEPII. See L. De Benedictis et al., *Network analysis of world trade using the BACI-CEPII dataset*, CEPII working paper, 2013; Rob Clark and Matthew C. Mahutga, "Explaining the trade-growth link: Assessing diffusion-based and structure-based models of exchange," *Social Science Research*, volume 42, number 2, March 2013. Also see the technical appendix for a discussion of our regression analysis.

10 See Chapter 4 and the technical appendix for more detail.

Exhibit E3

MGI Connectedness Index

Country connectedness index and overall flows data, 2012[1]

Rank of participation by flow as measured by flow intensity and share of world total

Economy: Developed, Emerging

Connectivity Index Rank: 1–10, 11–25, 26–50, 51+

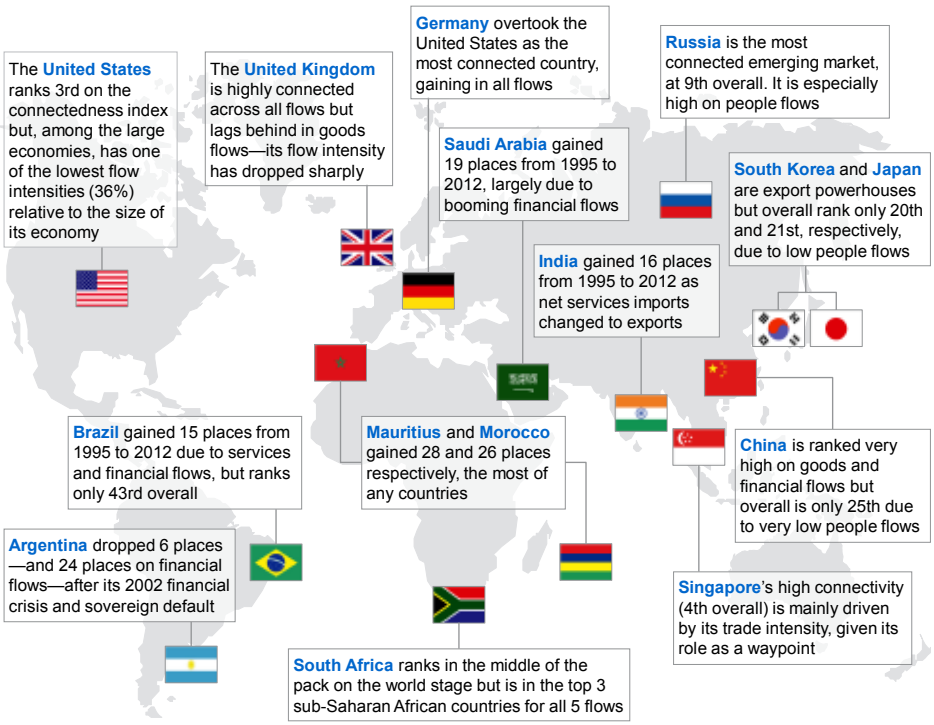
Flow intensity[2]: 100+, 70–99, <70

Rank	Country	Change in rank, 1995–2012[3]	Goods	Services	Financial	People (2010)	Data and communication (2013)	Flows value[4] $ billion	Flow intensity %	Change in flow intensity, 1995–2012 %
1	Germany	1	3	5	7	5	2	3,770	110	+53
2	Hong Kong, China		1	4	3	14		1,437	546	
3	United States	-1	8	9	5	1	7	5,622	35	+2
4	Singapore	1	2	3	4	18	5	1,198	436	+8
5	United Kingdom	-1	13	6	9	7	3	1,471	60	-26
6	Netherlands	2	6	7	15	29	1	1,213	157	+39
7	France	-1	9	10	36	15	4	1,581	60	+8
8	Canada	-1	16	22	13	9	18	1,381	76	-3
9	Russia		19	30	16	2	21	1,277	63	
9	Italy	0	11	20	31	16	10	1,187	59	+4
11	Belgium		4	8	30	39	11	937	194	
12	Spain	0	21	12	35	12	12	932	70	+14
13	Switzerland	-1	23	16	11	28	17	851	135	+64
14	Ireland	2	29	1	23	23	24	476	226	+32
15	Sweden	0	28	15	17	45	6	573	123	+17
16	Saudi Arabia	19	20	29	19	8	44	729	103	+40
17	Australia	-1	32	34	14	11	30	813	53	+5
18	Malaysia	1	10	23	34	26	32	528	173	-29
19	Poland	5	22	31	28	34	22	478	98	+41
20	South Korea		7	14	25	58	34	1,393	123	
21	Japan	-1	14	24	10	82	15	2,652	44	+18
21	Austria	-10	24	17	62	33	9	424	107	+22
24	Luxembourg		63	2	1	69	16	1,432	2,594	
25	China	5	5	21	6	93	33	5,124	62	+8
27	Mexico	-6	17	67	22	13	48	921	78	+17
27	Turkey	-1	30	43	32	31	31	524	66	+14
30	India	16	27	13	26	47	64	1,131	61	+37
35	Greece	-2	59	27	44	27	41	265	106	+65
36	Thailand	-3	12	19	27	94	56	630	172	+55
41	Chile	9	42	54	20	95	36	261	97	+38
43	Brazil	15	39	40	18	115	38	757	34	+11
43	New Zealand	-3	61	59	58	25	47	106	63	0
47	Argentina	-6	55	60	53	59	40	200	42	+9
49	South Africa	4	43	50	49	56	73	242	63	+12
50	Estonia	3	54	46	74	76	26	54	241	+72
53	Morocco	26	57	42	79	41	63	91	95	+46
54	Latvia	1	66	69	77	54	27	41	143	53
56	Indonesia	-3	31	49	39	113	65	494	56	-2
63	Nigeria		36	57	33	114	90	267	102	
63	Egypt	-12	60	41	115	53	61	139	53	+2
78	Tunisia	-19	58	66	93	102	62	53	116	11
85	Pakistan	-30	68	81	117	61	79	78	35	-8

1 Index calculations use migrants data for people flows and cross-border Internet traffic for data and communication flows.
2 Flow intensity represents the total value of goods, services, and financial flows as a share of the country's GDP.
3 Change in rank calculations do not include data and communication flows, for which data are not available for 1995.
4 Flows value represents total goods, services, and financial inflows and outflows.
NOTE: Blank cells indicate unavailable data.
SOURCE: Comtrade; IHS Economics & Country Risk; World Trade Organization; Telegeography; World Development Indicators, World Bank; McKinsey Global Institute analysis

Exhibit E4

Select findings from the MGI Connectedness Index: Changes and surprises for countries in their global flows participation


The United States ranks 3rd on the connectedness index but, among the large economies, has one of the lowest flow intensities (36%) relative to the size of its economy
The United Kingdom is highly connected across all flows but lags behind in goods flows—its flow intensity has dropped sharply
Germany overtook the United States as the most connected country, gaining in all flows
Russia is the most connected emerging market, at 9th overall. It is especially high on people flows
Saudi Arabia gained 19 places from 1995 to 2012, largely due to booming financial flows
South Korea and Japan are export powerhouses but overall rank only 20th and 21st, respectively, due to low people flows
India gained 16 places from 1995 to 2012 as net services imports changed to exports
Brazil gained 15 places from 1995 to 2012 due to services and financial flows, but ranks only 43rd overall
Mauritius and Morocco gained 28 and 26 places respectively, the most of any countries
China is ranked very high on goods and financial flows but overall is only 25th due to very low people flows
Argentina dropped 6 places —and 24 places on financial flows—after its 2002 financial crisis and sovereign default
Singapore's high connectivity (4th overall) is mainly driven by its trade intensity, given its role as a waypoint
South Africa ranks in the middle of the pack on the world stage but is in the top 3 sub-Saharan African countries for all 5 flows

SOURCE: Comtrade; UNCTAD; IMF Balance of Payments; World Development Indicators, World Bank; McKinsey Global Institute analysis

Knowledge-intensive flows—rather than labor-, capital-, or resource-intensive—increasingly dominate global flows

In addition to examining the major flows individually, we isolate the knowledge-intensive portion of each. Knowledge-intensive goods and services flows (as opposed to labor-, capital- or resource-intensive ones) include goods and activities that have a high R&D component or utilize highly skilled labor. As such, they help transmit information, ideas, or expertise among exchanging parties. Examples include high-tech products such as semiconductors and computers, pharmaceuticals, automobiles and other machinery, and business services such as accounting, law, and engineering. Within financial flows, we consider foreign direct investment to be knowledge-intensive, as it often entails transfer of management expertise and technology as well. In addition, payments for royalties and patents, business traveler spending, and cross-border telecom revenue from businesses are knowledge-intensive. The value of these flows together reached $12.6 trillion in 2012, nearly half the combined total value of goods, services, and financial flows and more than the combined 2012 GDP of China and Germany. This mirrors the rise of the knowledge economy globally.

Moreover, we find that the knowledge-intensive components of global flows are growing faster and thus gaining share from capital-, labor-, and resource-intensive flows. Trade in knowledge-intensive goods, such as pharmaceuticals or semiconductors, is growing around 1.3 times as fast as trade in labor-intensive goods such as textiles and toys.[11] The same is true in services.

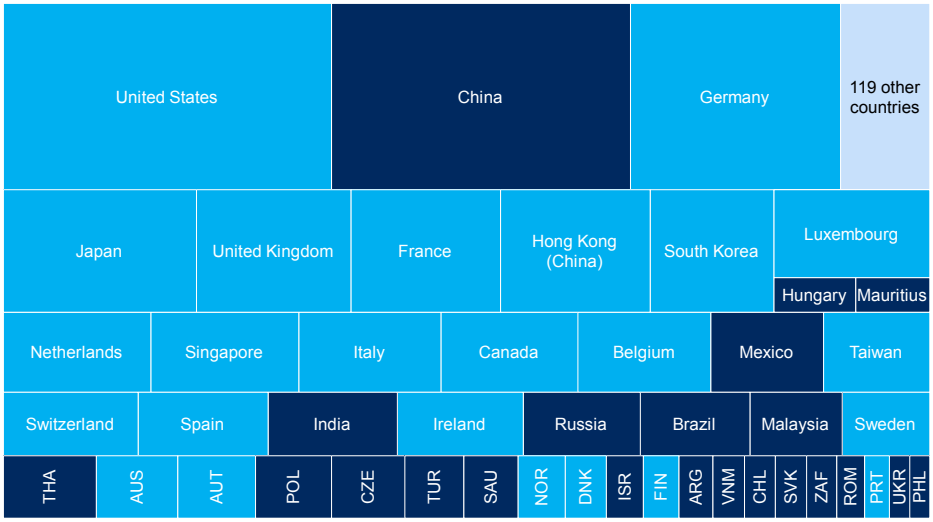
Today, countries in the developed world account for two-thirds of knowledge-intensive flows (Exhibit E5). Moreover, over the past ten years, developed economies have seen knowledge-intensive flows relative to GDP grow more quickly than in emerging economies, perhaps reflecting their more highly skilled labor forces, better-developed innovation platforms, and more advanced connectedness, especially in technology. To gain share of these flows, emerging economies would need to accelerate efforts to build skilled workforces, develop institutions that enable and encourage innovation in the private sector, and improve their Internet infrastructure that underlies data and communication flows.

Exhibit E5

The vast majority of knowledge-intensive inflows and outflows occur in developed economies

Total knowledge-intensive inflows and outflows, 2012[1]

Relative area corresponds to the portion of global inflows/outflows



1 A knowledge-intensive flow is a flow with embedded information, ideas, or expertise that is transferred when exchanged. Foreign direct investment is classed as a knowledge-intensive flow because it often entails the transfer of embedded ideas, management expertise, and technology.

SOURCE: Comtrade; IMF Balance of Payments; McKinsey Global Institute analysis

11 The nominal value of global commodity flows over the past ten years has grown faster, reflecting the large price increase in oil and hard minerals. If measured in real, price-adjusted terms, then knowledge-intensive flows have grown faster.

Digitization is transforming all flows and expanding opportunities for smaller players to participate

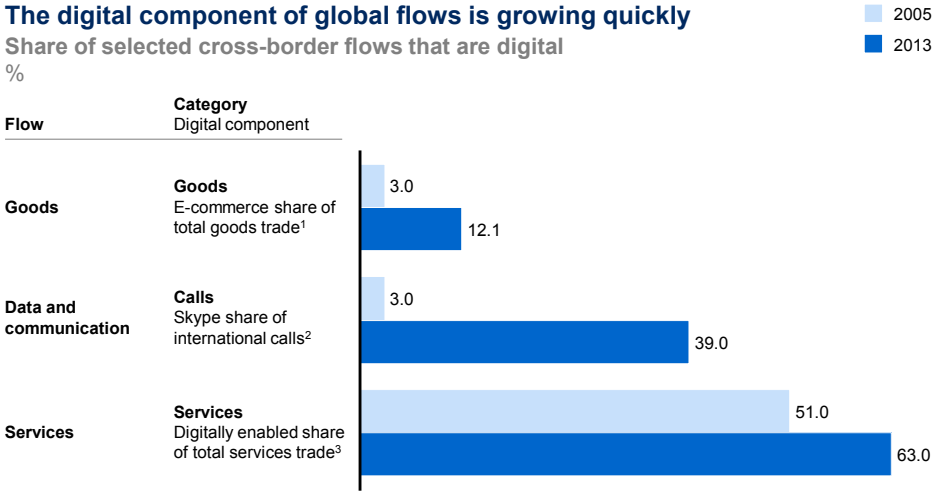
The rise of digital technologies is not only powering the flow of data and communication but also transforming and enabling flows of goods, services, capital, and even people (Exhibit E6). Digitization is transforming global flows in three ways.

Exhibit E6

The digital component of global flows is growing quickly

Share of selected cross-border flows that are digital

%



1 Based on China data.
2 Excludes other VOIP minutes.
3 Based on US data.
NOTE: 2005 values for services are calculated by interpolating from prior and subsequent years based on constant growth rates.
SOURCE: iResearch; Telegeography; OECD; US Bureau of Economic Analysis; McKinsey Global Institute analysis

The first way is by changing tangible flows into digital flows with lower costs of access, transport, and marginal production. One prominent example is rising cross-border trade in items such as e-books and digital news and entertainment, and greater penetration of e-readers, MP3 players, and game consoles. In some manufacturing industries, 3-D printing can transform the shipment of a physical good into the online transfer of a digital file that can be used to produce the good at its point of consumption. Many digital flows create value but have not been fully monetized—for example, YouTube provides videos to users for free but makes fees from advertisements before the videos run. The advertising revenue reflects only a small part of the value to consumers from YouTube.

Digital technology is also turning some physical flows of people into virtual flows. The growing ubiquity of email first made it feasible to work remotely from anywhere in the world, and tools for virtual collaboration, such as Google Docs, and file-sharing, such as Dropbox, continue to expand these possibilities. We also see a proliferation of online labor marketplaces, such as oDesk and Mechanical Turk, which bring jobs to people around the world rather than requiring people to migrate for jobs.

The second crucial aspect of digitization is its potential to enhance physical flows—making them more manageable and, in many cases, more valuable—through the addition of "digital wrappers." For example, digital tracking of physical shipments has reduced the volume of goods lost in transit and has helped boost trade in goods and enabled cross-border e-commerce.

Third, digitization is creating online platforms that facilitate production and cross-border exchanges. Online exchanges such as eBay and Alibaba are two of the linchpins of global e-commerce, facilitating exports. More than 90 percent of eBay commercial sellers export to other countries, compared with an average of less than 25 percent of traditional small businesses. Online platforms enable even the smallest SMEs (small and medium-sized enterprises) and even individuals to become micromultinationals. Fund-raising platforms such as Kickstarter enable individuals to raise money across borders. The Samasource platform seeks to extend microwork and microfinance models to people who have not had the opportunity to participate in global flows to date.

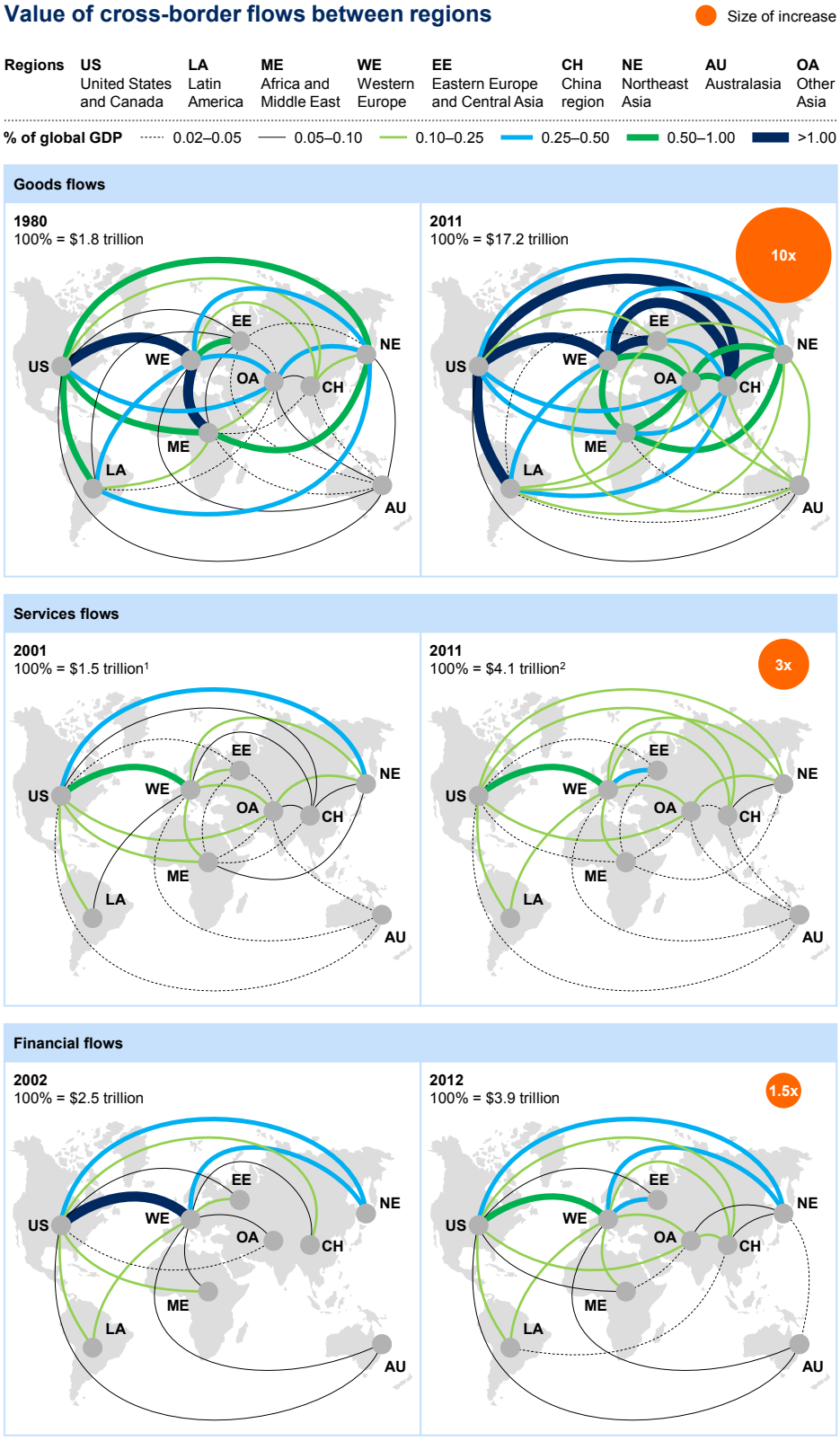
The power of digitization comes especially from its marginal cost economics that reduce costs associated with access, discovery, and distribution of goods and services to nearly zero. As a result, the cost of participating in flows is lowered for individuals, small firms, and entrepreneurs. This is already leading not only to innovations in business models but also to the emergence of micromultinationals, microwork, and microsupply chains that are able to tap into global opportunities. This significantly removes barriers to participating in global flows, broadening opportunities. It also will put pressure on *all* companies to innovate their business models to capture the opportunities and respond to new sources of competition, and to counter the pressure on their existing business models from digitization's marginal-cost economics.

Networks of global flows are broadening and deepening to more countries and a wider range of companies

Once concentrated among the largest advanced economies, global flows are now growing more dispersed, embracing an ever larger number of countries and participants within those countries. Well-established trading routes are deepening and broadening, and networks are expanding as the emerging world becomes more deeply integrated into global value chains, a development that has accelerated over the past decade. This change can be seen visually for goods, financial, and data flows in Exhibits E7 and E8.

Exhibit E7

Value of cross-border flows between regions

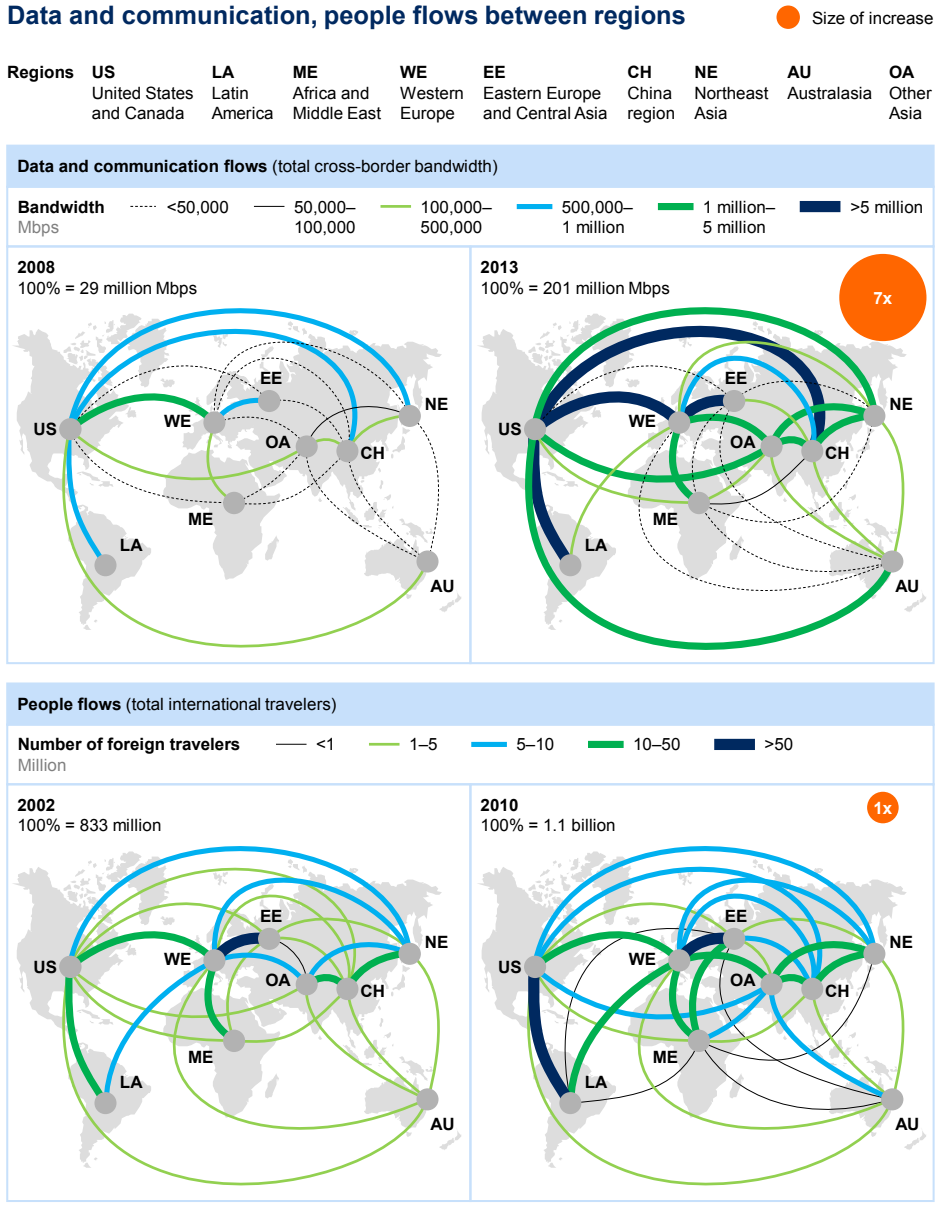


1 2001 services flows are estimated based on 55 percent coverage with a bilateral data set.
2 2011 services flows are estimated based on 61 percent coverage with a bilateral data set.

SOURCE: Comtrade; IMF Balance of Payments; World Development Indicators, World Bank; McKinsey Global Institute analysis

Exhibit E8

Data and communication, people flows between regions



SOURCE: Telegography; World Trade Organization; McKinsey Global Institute analysis

New routes have increased their share of the whole network. For instance, 40 percent of the increase in goods trade since 1990 has come from only 2 percent of trade routes—around half of which were not in the top 50 routes in 1990. The share of the largest routes in total trade has fallen. The top 50 goods trading routes accounted for 63 percent of world goods trade in 1990 but only 54 percent in 2011. In the case of data and communication flows, the speed of change is even faster: the top 50 routes carried nearly half of Internet traffic in 2006 but only one-third in 2013.

The proportion of cross-border flows that occurs between countries within a region vs. in different regions varies by flow. Intraregional flows account for nearly two-thirds of data and communication flows and people flows and nearly half of services flows—but only one-third of goods flows or financial flows. Western Europe has the highest share of intraregional flows in the world, reflecting the creation of the European Union and the euro. In contrast, the share of trade within the North American Fair Trade Agreement (NAFTA) has actually declined over the past decade as trade with China has grown. Connectivity between emerging regions is also increasing rapidly. South-South trade has grown at double-digit rates annually for the past three decades, rising from 6 percent of global trade in 1990 to 24 percent by 2012.

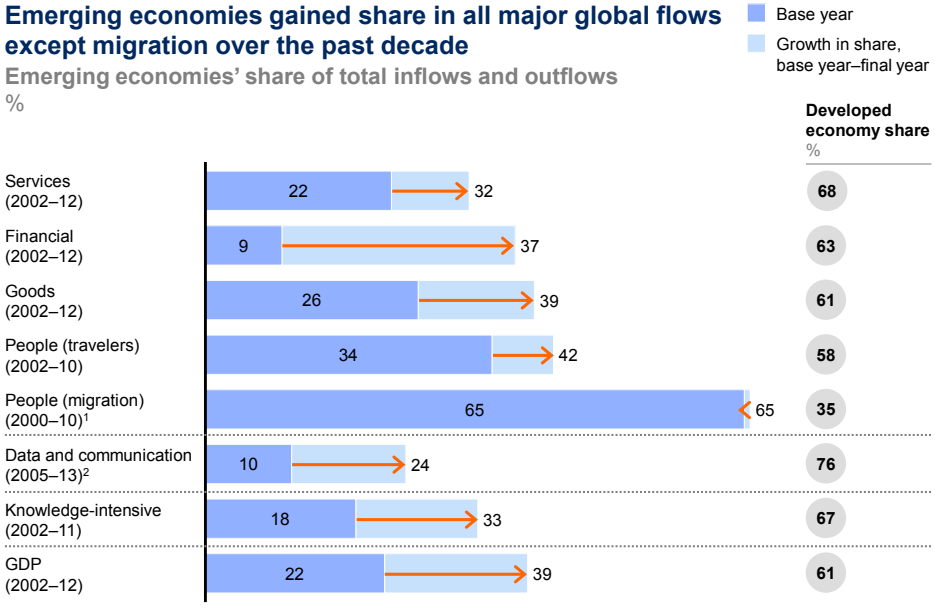
The emerging world is gaining a stronger foothold in global flows. In 2012, emerging economies accounted for 39 percent of goods flows and 37 percent of financial flows, up from 26 percent and 9 percent, respectively, in 2002 (Exhibit E9). Their participation in global services flows is lower, however.

Exhibit E9

Emerging economies gained share in all major global flows except migration over the past decade

Emerging economies' share of total inflows and outflows

%



1 Emerging economies accounted for 65.4 percent of migrants in 2000 and 64.7 percent in 2010.
2 Measured by cross-border bandwidth.

SOURCE: IHS Economics & Country Risk; Comtrade; Telegeography; IMF Balance of Payments; World Development Indicators, World Bank; McKinsey Global Institute analysis

Emerging markets' share of global goods flows has increased even more sharply in terms of volume than in terms of value. This is apparent in many major categories of goods (including automobiles, computers, and books, to name just a few), reflecting the new role of emerging economies as powerhouses of global production. It also reflects the predominance of lower-value goods, such as labor-intensive manufactured goods, in emerging-market trade, although such flows are growing more slowly than knowledge-intensive ones overall.

In data and communication flows, emerging economies lag significantly behind developed economies. They account for just 24 percent of cross-border Internet traffic, and only three of the top 20 countries in broadband penetration are outside high-income countries: Israel, Slovenia, and the United Arab Emirates. Low penetration has reinforced high bandwidth prices. IP transit costs in Lagos are 21 times as high as in London. Despite the promise of the Internet as an equalizing platform, the growing digital divide could leave developing economies further behind.

Cities can also participate in global flows by acting as waypoints that link large parts of networks. For example, cities with major ports can become critical hubs in the global flow of goods, such as Singapore, while those with the right infrastructure and open policies can become waypoints for data and communication flows, such as Amsterdam. Acting as a waypoint can generate significant economic output and high-quality jobs, and it helps a city accumulate knowledge, with positive spillover effects on the broader economy. We find that only six cities are major hubs across all types of flows—Dubai, London, Hong Kong, New York, Singapore, and Tokyo—suggesting significant opportunities for other cities to play a more prominent role in global flows.[12]

Smart strategy and policy could expand these opportunities

The new landscape of global flows offers more entry points to a far broader range of players than in the past. Emerging markets, small businesses, and individuals will all be able to play a larger role, thanks to digitization and falling costs. But companies, policy makers, and individuals need to ensure that they keep pace with change and adapt their approaches if they are to take full advantage of global flows.

While most executives have thought in global terms about their businesses for many years, McKinsey research has found that Western multinationals remain significantly underweight in emerging markets, and that up-and-coming global companies from these countries are investing aggressively. That means executives need to redouble their efforts for this next wave of global flows. They must plan early to scale up internationally, adapt business models to different markets, get to know and monitor their new competitors, develop talent to manage a global enterprise, and prepare for shocks and volatility in an increasingly interconnected world economy. There will be significant scope to carve out new opportunities enabled by digital technologies, including opportunities for big data and analytics and the creation of new digital platforms

12 *Urban world: Cities and the rise of the consuming class*, McKinsey Global Institute, June 2012.

to enable and support participation in flows and new types of business models. Businesses that largely focused on cost effectiveness in their global supply chains now increasingly need to prioritize value, considering how value chains may evolve as a result of global flows, including who the participants may be, which regions may play a role, and where value may be created along the value chain. Established companies also need to brace themselves for a new wave of competition propelled by the low cost of starting up a business in a digital era—from large, already global companies from the emerging world to small, nimble entrepreneurs and even companies from outside their own sectors—as digital technologies shift value between sectors. This era of global flows is unfolding new opportunities for globally minded entrepreneurs to disrupt established business models by operating as micromultinationals within global value chains. However, all companies, large and small, will need to think carefully about the business models that enable monetization, data security, and intellectual property issues that come with digitization.

Individuals stand to gain in many ways. As consumers, they will enjoy the benefits of vastly expanded choices of products and services as well as from digitization, which is making the benefits of cross-border flows more accessible at a lower cost and delivered through a proliferation of new channels. There will be greater possibilities for individuals to become entrepreneurs in for-profit as well as social ventures. As workers, individuals can take advantage of this new landscape to claim greater flexibility in the workplace through the use of virtual collaboration technology such as web meeting software and file-sharing sites. They can offer their services around the world through online work platforms, and the most educated citizens in the world's poorer countries will find attractive opportunities to join the global labor market. Workers in advanced economies will need to continually upgrade their skills if they are to thrive in the knowledge economy and meet strong demand for specific capabilities from business. Other workers may lose in this transition—at least in the short term—so their challenge will be to retrain for the opportunities that are available, and many will need support to do so.

Policy makers in developed and emerging markets face pressing questions, too. Taking factors such as the stage of economic development and sources of comparative advantage into account, how should their economy participate in flows? Given that the more open a country is to inflows and outflows alike, the greater the economic benefits are likely to be, so what can the government do to enable participation through the right business environment, infrastructure, and talent? How can governments ensure that the benefits of flows are shared fairly across society? What trade, investment, and immigration policies do they need? Perhaps above all, is their economy in a position to capitalize on the growing trend toward knowledge-intensive and digital flows? In all aspects of policy they need to move away from the mercantilist mindset of the past to thinking that is more reflective of an increasingly interconnected global economy and that encourages participation in global flows.

There is a shared imperative for businesses and policy makers to plug gaps in data on global flows that currently limits our full understanding. Only by being more broadly informed will they be able to engage in smart strategy and smart policy making.

□ □ □

We now take for granted that we live in an interconnected world, but a closer examination of global flows reveals a web of connections that continues to evolve. While the last era of globalization can be characterized by the search for low-cost production, the next era will be one in which knowledge-intensive flows are an increasingly large and dynamic component of this cross-border activity. Digitization is profoundly changing the composition of flows and how they travel, opening up new opportunities to SMEs and individuals. The network of flows is being redrawn as supply chains become more global and emerging economies become more central hubs in the world economy. The pace of change is likely to accelerate even more dramatically as more of the world goes online. For players of all types—whether regions, countries, cities, businesses, or individuals—there are major economic opportunities from participating in global flows. The imperative for policy makers is to fully embrace the new era and ensure that their economies are positioned to benefit from it.

Related McKinsey Global Institute research

Lions go digital: The Internet's transformative potential in Africa (November 2013)

Despite a slow start, Africa's digital development is now accelerating and the continent is already producing innovative web-based applications and dynamic new business models. Most exciting of all are the possibilities for using the Internet to revamp the delivery of education, health, and other public services—transforming lives in the process.

Urban world: The shifting global business landscape (October 2013)

The rise of developing economies is changing where and how the world does business. For the past three decades, they have been a source of low-cost but increasingly skilled labor. Their fast-growing cities are filled with millions of consumers, who provide a new growth market for global corporations at a time when much of the developed world faces slower growth as a result of aging and other factors.

Game changers: Five opportunities for US growth and renewal (July 2013)

MGI set out to look for catalysts that can reignite growth in the US economy. This report identifies five "game changers" that can add hundreds of billions of dollars to annual GDP and create millions of new jobs by 2020. These game changers present exceptional opportunities today due to changing factor costs, new technologies, and lessons on what policies work.

Disruptive technologies: Advances that will transform life, business, and the global economy (May 2013)

It is critical that business and policy leaders understand which technologies will matter to them and prepare accordingly. This report identifies 12 technologies that could drive massive economic transformations in the coming years. It also looks at how these technologies could change our world, as well as their benefits and challenges, and offers guidelines to help business and policy leaders respond.

Financial globalization: Retreat or reset? (March 2013)

Cross-border capital flows remain 60 percent below their pre-crisis peak, and growth in financial assets around the world has stalled. Continued retrenchment could jeopardize investment and recovery unless policy makers can "reset" the financial system for a healthier flow of financing that supports economic growth.

Manufacturing the future: The next era of global growth and innovation (November 2012)

Manufacturing remains critically important to advanced economies, where it is a vital source of innovation, R&D, exports, and growth. In the developing world, it can provide a pathway out of subsistence agriculture, raising incomes and living standards. But the manufacturing sector has changed, bringing opportunities and challenges to business leaders and policy makers.

www.mckinsey.com/mgi

E-book versions of selected MGI reports are available at MGI's website, Amazon's Kindle bookstore, and Apple's iBookstore.

Download and listen to MGI podcasts on iTunes or at www.mckinsey.com/mgi/publications/multimedia/

McKinsey Global Institute
April 2014
Copyright © McKinsey & Company
www.mckinsey.com/mgi

@McKinsey_MGI

McKinseyGlobalInstitute